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c) Listing of Claims:

1 - 8. (Cancelled)

9. (New) A process for producing low-molecular olefins by thermal pyrolysis of hydrocarbons said process comprises steps:

- a) preparation of evaporated feedstock steam mixture,
- b) preheating the resulting mixture
- c) heating said mixture up to pyrolysis temperature,
- d) a supply with a heat, which is necessary for pyrolysis, into the process stream,
- e) quenching a product stream, and
- f) fractionation of the product stream, wherein

in the step a) amount of added steam-diluent per mass of hydrocarbon feedstock does not exceed the limits accepted in existing pyrolysis plants,

steps c) and d) are performed in a reactor, comprising: a hollow housing having a nipple for inlet stream, and a nipple for outlet stream, and stationary blades;

a rotatable wheel with a work blades is positioned in said housing so that said wheel with said housing together form an annular work cavity,

said cavity is formed so and said stationary blades and work blades are positioned in said cavity and are shaped to create a ring vortex flow in said cavity when said wheel is rotated, and

said nipple for inlet stream and said nipple for outlet stream are communicated with said work cavity,

step c) is performed by mixing of said mixture with hot process stream being circulated in said work cavity, for a negligible time in comparison with the residence time,

step d) is performed by using heat, generated directly in the

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process stream in result of hydrodynamic drag of said rotated work blades.

10. (New) The process of claim 9, wherein a gas-turbine engine is used as a drive of said reactor, and step b) is performed in two stages, and first stage of said preheating is carried out in first heat exchanger utilizing heat of exhaust gases of said gas-turbine engine, and

second stage of said preheating is carried out in second heat exchanger utilizing heat of hot product stream outgoing from said reactor.